

## AN OVERVIEW OF RECENT INITIATIVES IN PREVENTING DAMAGE TO ENERGY PIPELINES

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### ABSTRACT

Over the past 20 years, excavation damage has caused approximately one-third of energy pipeline incidents resulting in fatalities or in-patient hospitalizations in the U.S. While excavation damage to pipeline facilities has declined in recent years, reducing excavation damage to energy pipelines remains a top priority for the United States. The Pipeline and Hazardous Materials Safety Administration (PHMSA) of the U.S. Department of Transportation is undertaking several initiatives to reduce excavation damage to energy pipelines. This paper summarizes several of these initiatives, including: PHMSA's strong support of the 1999 Common Ground Study, the Common Ground Alliance (CGA), and the continued development of damage prevention best practices for all damage prevention stakeholders; the documentation of State damage prevention programs to understand where programs can be strengthened; support of State damage prevention programs in the form of funding and other assistance to states for implementation of the "nine elements" of effective damage prevention programs; a focused damage prevention research and development program; the coordination of the Pipelines and Informed Planning Alliance (PIPA), which is an effort to develop and foster the use of recommended practices for local land use in the vicinity of transmission pipelines; and the development of a rule for federal enforcement of damage prevention laws when appropriate. PHMSA believes comprehensive damage prevention programs are essential to energy pipeline safety and must have the right balance of incentive and enforcement for preventing damage to pipelines.

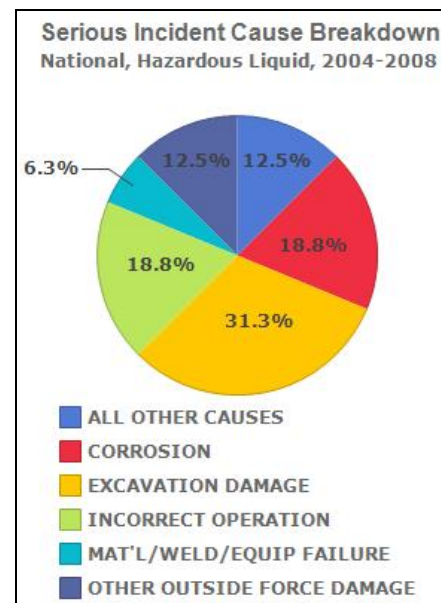
### INTRODUCTION

Due to the efforts of many excavation damage prevention stakeholders across the country, excavation damage to pipeline facilities has declined in recent years. However, excavation damage continues to be a leading cause of all energy pipeline

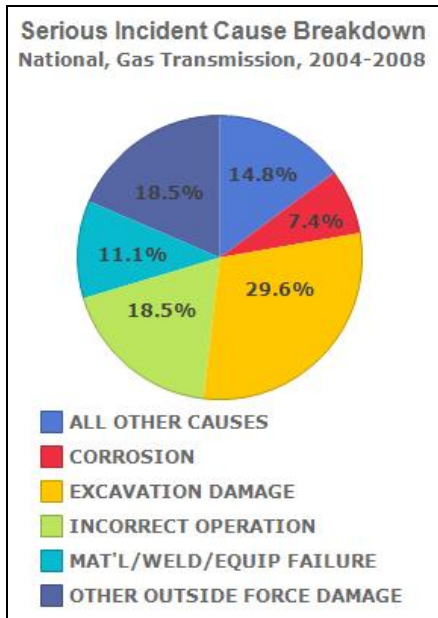
incidents in the United States as well as a leading cause of high-consequence energy pipeline incidents.

PHMSA defines "serious" pipeline incidents as those incidents reported by pipeline operators involving a fatality or injury requiring in-patient hospitalization. In the five year period from 2004 to 2008, excavation damage was identified as the cause of:

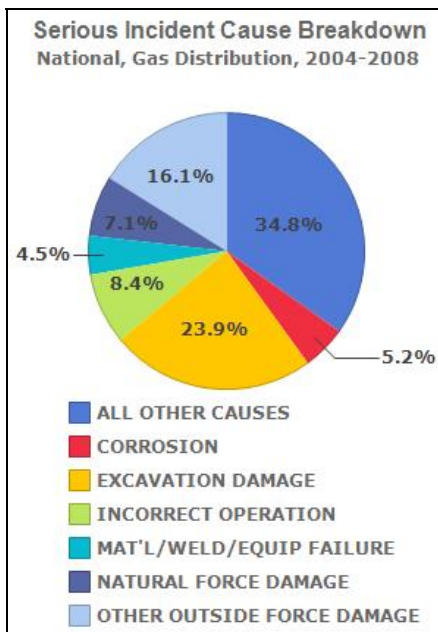
- 31.3% of serious hazardous liquid pipeline incidents
- 29.6% of serious natural gas transmission pipeline incidents
- 23.9% of serious natural gas distribution pipeline incidents



**Figure 1.** Causes of serious hazardous liquid pipeline incidents, 2004-2008. Source: PHMSA Incident Files.



**Figure 2.** Causes of serious natural gas transmission pipeline incidents, 2004-2008. Source: PHMSA Incident Files.



**Figure 3.** Causes of serious natural gas distribution pipeline incidents, 2004-2008. Source: PHMSA Incident Files.

These high-consequence pipeline incidents resulting from excavation damage are largely preventable through effective excavation damage prevention practices and programs.

Effective damage prevention is a shared responsibility. Damage prevention stakeholders include excavators, underground utility locators, pipeline operators and other underground utility owners/operators and their trade associations, the construction industry, railroads, one call centers, equipment manufacturers, insurance providers,

emergency responders, public and community organizations, consensus standards organizations, environmental organizations, and federal, state, and local government regulators. These damage prevention stakeholders are engaged in a large variety of efforts to reduce excavation damage to underground utilities. Over the past decade, PHMSA has been a national partner and leader in efforts to prevent excavation damage to the nation's energy pipeline infrastructure.

## NOMENCLATURE

ANPRM – Advance Notice of Proposed Rulemaking

CGA – Common Ground Alliance

DPAP – Damage Prevention Assistance Program

NTDPC – North American Telecommunications Damage Prevention Council

PHMSA – Pipeline and Hazardous Materials Safety Administration

PIPA – Pipelines and Informed Planning Alliance

PIPES Act – Pipeline Safety, Inspection, Protection, Enforcement, and Safety Act of 2002

PSIA – Pipeline Safety Improvement Act of 2002

SDP Grants – State Damage Prevention Grants

## THE COMMON GROUND STUDY AND THE COMMON GROUND ALLIANCE

In 1999, PHMSA published the Common Ground Study, which established damage prevention best practices for all stakeholders. These best practices have evolved over time and remain one of the most important tools available to stakeholders in the prevention of excavation damage to all underground utilities. The best practices address the following areas of concern in damage prevention:

- Project planning and design
- One call center operations
- Locating and marking of underground infrastructure
- Excavation
- Mapping
- Regulatory compliance
- Public education and awareness
- Damage reporting and data evaluation

As an outgrowth of the Common Ground Study, the Common Ground Alliance (CGA – <http://www.commongroundalliance.com>) was formed in 2000 as a nonprofit organization that provides stewardship of the best practices, promotes stakeholder participation, supports damage prevention research, fosters public awareness and education, and serves as a damage prevention data steward and clearinghouse.

Since its inception, the CGA has grown to over 1,300 individual members, 165 member organizations, and 40 sponsors.<sup>1</sup> PHMSA has been, and continues to be, an avid supporter of the CGA and believes the CGA model is essential to reducing excavation damage to energy pipelines and other underground infrastructure.

## THE PIPES ACT AND THE NINE ELEMENTS

PHMSA's efforts to advance damage prevention have been recognized and moved forward by the United States Congress as an important component of energy pipeline safety. Approximately every four years, PHMSA is authorized to continue to function by Congress through a reauthorization statute. Congressional reauthorization also sets PHMSA's regulatory and programmatic agenda for the coming four years. The reauthorization bills of 2002 and 2006 have been particularly important with regard to PHMSA's damage prevention efforts. The 2002 reauthorization bill is known as the Pipeline Safety Improvement Act, or PSIA, of 2002 (Public Law 107-355). The 2006 reauthorization bill is known as the Pipeline Inspection, Protection, Enforcement, and Safety (PIPES) Act of 2006 (Public Law 109-468).

Both the PSIA of 2002 and the PIPES Act of 2006 emphasized excavation damage prevention. The PSIA, for example, authorized several grant programs for states and communities. These grant programs have improved damage prevention programs at the state and local levels. The PIPES Act of 2006, however, significantly elevated PHMSA's ability to improve damage prevention efforts nationwide and clearly stated the principles by which this new ability is guided.

Specifically, the PIPES Act of 2006 listed nine elements of effective damage prevention programs. These nine elements originated in a PHMSA-sponsored, multi-stakeholder study of distribution pipeline integrity management, which recognized the importance of effective damage prevention programs in maintaining the integrity of energy pipelines. The nine elements can be summarized as follows:

1. Effective communication between utility operators and excavators from excavation notification to completion of excavation
2. Support and partnership of all stakeholders
3. Pipeline operators' use of performance measures for locators
4. Partnership in employee training
5. Partnership in public education
6. A dispute resolution process that defines the enforcement agency as a partner and facilitator
7. Fair and consistent enforcement of the law
8. Use of technology to improve damage prevention processes
9. Data analysis to continually improve program effectiveness

These nine elements are further described in a PHMSA document entitled, "Damage Prevention Assistance Program (DPAP): Strengthening State Damage Prevention Programs", available at <http://primis.phmsa.dot.gov/comm/publications/DPAP-Guide-FirstEdition-20080911.pdf>. Commonly referred to as the "DPAP Guide", this document illustrates the intent and meaning of the nine elements and provides simple examples of efforts states can undertake to improve their damage prevention programs.

## DOCUMENTING STATE DAMAGE PREVENTION PROGRAMS

Effective damage prevention, while nationally important, is essentially executed at state and local levels. Each state in the United States has its own damage prevention laws, regulations, and processes (collectively referred to as state damage prevention programs). While there are common themes among these state programs, no two states are exactly identical in their approach to damage prevention.

The nine elements guide PHMSA's efforts to assist states with improving their damage prevention programs. However, the nine elements are not prescriptive. Instead, they describe the principles that states should follow as they develop their damage prevention programs. While effective programs should be guided by these nine elements, the states should have the authority and latitude to implement the nine elements as appropriate within their borders. One size does not necessarily fit all in the execution of effective damage prevention programs.

The diversity of state damage prevention laws and regulations, as well as the diversity of states' efforts to procedurally and technically implement the nine elements, has resulted in a mixed national damage prevention landscape. PHMSA is seeking to document this landscape to 1) bring transparency to the national damage prevention picture, and 2) identify strengths and weaknesses among state damage prevention programs. This documentation is intended to be a resource to the states and PHMSA for highlighting programs other states might use as models for developing to their own programs and for identifying where improvements are needed and where federal assistance may be applied.

PHMSA is documenting state damage prevention programs in two ways. The first way entails interviewing key state damage prevention stakeholders to document states' efforts to implement the nine elements. Through this process, PHMSA seeks to better understand what specific initiatives each state has undertaken to put the nine elements into practice. The second way PHMSA is documenting state damage prevention programs is through a review of state damage prevention laws and regulations. In cooperation with the North American Telecommunications Damage Prevention Council (NTDPC), PHMSA is developing documentation that parses each state's damage prevention laws and regulations into simple categories for easy comparison between states. PHMSA intends to make the results of both documentation efforts available on its website in a format that is fair and useful to all damage prevention stakeholders. Documenting each state's degree of implementation of the nine elements, as well the requirements of state damage prevention laws and regulations, will lend much-needed transparency to an often confusing damage prevention landscape that ultimately influences the integrity of the national energy pipeline infrastructure that PHMSA regulates.

## FINANCIAL ASSISTANCE TO STATES

In the PIPES Act of 2006, Congress recognized that states would require financial assistance to effectively implement the nine elements. The Act authorized \$1.5 million annually for the State Damage Prevention (SDP) grant program, which provides states up to \$100,000 each to assist with implementation of the nine elements. PHMSA has awarded over \$4 million in funding to 30 state organizations since the program's inception in 2008. The objectives of the funded projects vary considerably, but all of the projects are designed to assist states with implementing the nine elements. Information about the grant projects is available at <http://primis.phmsa.dot.gov/sdp/>.

## RESEARCH AND DEVELOPMENT

PHMSA's research and development (R&D) program goal is to drive improvements in various aspects of pipeline safety, including damage prevention. PHMSA employs technical review committees comprised of a broad range of pipeline safety stakeholders to identify R&D priorities and select projects for funding. The program focuses on the rapid conversion of new technology into tools that pipeline safety stakeholders can use to improve pipeline safety. Completed R&D projects often provide the technical basis for regulations and consensus safety standards. Other R&D projects summarize information required by pipeline safety stakeholders to make well-informed decisions. More information about PHMSA's R&D program is available at <http://primis.phmsa.dot.gov/rd/>.

## THE PIPELINES AND INFORMED PLANNING ALLIANCE

Urban and suburban developmental encroachment on once-rural transmission pipeline rights-of-way is a growing risk to both public safety and pipelines. Initiated and supported by PHMSA, the Pipelines and Informed Planning Alliance (PIPA) initiative aims to improve damage prevention and pipeline safety by enhancing communication between transmission pipeline operators and property owners/developers, and to ensure that decisions about land use and development near transmission pipelines are risk-informed.

The PIPA participants represent a wide spectrum of stakeholders, including property developers, the real estate industry, local, state, and federal government, fire marshals, the public, and the transmission pipeline industry. The PIPA participants are working in three separate task teams to consider and develop recommended practices related to protecting communities, protecting transmission pipelines, and communicating among stakeholders.

The PIPA initiative began in January 2008 and so far has resulted in several recommended practices related to risk-informed land use planning and development adjacent to transmission pipelines. It is currently projected that these practices will be made available in the PIPA report in the first

half of calendar year 2010. More information about PIPA is available at <http://primis.phmsa.dot.gov/comm/PIPA.htm>.

## THIRD-PARTY EXCAVATOR ENFORCEMENT

PHMSA currently has enforcement authority over first-party (pipeline operators) and second-party (pipeline operators' contractors) excavators who unlawfully damage underground pipelines during excavation activity. The U.S. Congress recognized the importance of enforcement in effective damage prevention in the PIPES Act, which gives PHMSA new authority to conduct civil enforcement against third-party excavators if the state in which the excavator works has failed to do so effectively.

This new enforcement authority is limited, however. Section 2 of the PIPES Act imposes the following limitation on PHMSA's authority to conduct Federal civil enforcement actions against excavators:

[PHMSA] may not conduct an enforcement proceeding...for a violation within the boundaries of a state that has the authority to impose penalties...against persons who violate that state's damage prevention laws, unless [PHMSA] has determined that the state's enforcement is inadequate to protect safety...and until [PHMSA] issues, through a rulemaking proceeding, the procedures for determining inadequate state enforcement of penalties.<sup>ii</sup>

This limitation of authority requires PHMSA to establish, through rulemaking, procedures for evaluating and declaring state enforcement inadequate, and then find a given state's enforcement to be inadequate using those procedures before resorting to federal enforcement in that state.

To address this requirement of the PIPES Act, PHMSA published an Advance Notice of Proposed Rulemaking (ANPRM) in the Federal Register on October 29, 2009. An ANPRM is an optional, supplementary procedure the federal government can use to help prepare a proposed rule. It requests information – in the form of comments from the public and affected stakeholders – that is necessary for developing a proposed rule.

The ANPRM outlined the reasons PHMSA is pursuing the enforcement rulemaking, described PHMSA's recent damage prevention initiatives, and requested comments on the following issues:

- The criteria PHMSA should use to assess the adequacy of state damage prevention law enforcement programs;
- The administrative process states will use to contest a notice of inadequacy;
- The federal standards PHMSA should use as a basis for enforcement;
- The adjudication process for excavators that are cited by PHMSA, and;
- The adequacy of existing PHMSA damage prevention standards for pipeline operators.

The comment period was open through December 14, 2009. PHMSA received significant comments and is currently reviewing the comments and determining the best future path for promulgating a rule.

PHMSA's strongly believes that damage prevention law enforcement is a state responsibility. This new rulemaking is, therefore, intended to provide an incentive to the states to make legislative and/or regulatory changes that will strengthen their enforcement capabilities. States with fair, balanced, and effective damage prevention law enforcement programs have reduced rates of excavation damage as compared to states with weaker enforcement programs.

The entire text of the ANPRM, all supporting documentation, and all comments received are available at <http://www.regulations.gov> by searching on Docket ID PHMSA-2009-0192.

## CONCLUSION

PHMSA is pursuing multiple initiatives to address the challenge of reducing excavation damage to energy pipelines in the United States. PHMSA recognizes that partnering with all damage prevention stakeholders across the country is essential to success. The primary avenue of this partnership is the Common Ground Alliance and PHMSA will continue to be a strong supporter of the CGA and the damage prevention best practices. While national partnership is very important, success is also heavily dependent upon the efforts of state-level stakeholders. PHMSA is a partner and supporter of the states in their efforts to improve their damage prevention programs. Improved damage prevention technology and knowledge also play an important role and PHMSA maintains a robust research and development program designed to fund and quickly deploy the use of new damage prevention technologies and knowledge. Land use planning that takes into account the risks associated with energy transmission pipelines is also essential; the Pipelines and Informed Planning Alliance is therefore designed to foster the use of recommended practices for local land use in the vicinity of transmission pipelines. Finally, state-level damage prevention law enforcement that is effective, fair, and balanced reduces excavation damage, and PHMSA's new enforcement rulemaking is designed to give incentive to states to improve their enforcement programs.

## REFERENCES

- Common Ground Alliance Website,  
<http://www.commongroundalliance.com>, Feb. 11, 2010
- PHMSA Incident Files, Oct. 2009
- PHMSA Websites, Feb 26, 2010
- Stakeholder Communications –  
<http://primis.phmsa.dot.gov/comm>
- Research and Development –  
<http://primis.phmsa.dot.gov/rd/>
- Pipeline Inspection, Protection, Enforcement, and Safety  
(PIPES) Act of 2006 (Public Law 109-468, Section  
2(f))

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<sup>i</sup>[http://www.commongroundalliance.com/Template.cfm?Section=About\\_CGA](http://www.commongroundalliance.com/Template.cfm?Section=About_CGA), Feb. 11, 2010

<sup>ii</sup> Pipeline Inspection, Protection, Enforcement, and Safety  
(PIPES) Act of 2006 (Public Law 109-468, Section  
2(f))